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ABSTRACT

The past decade has seen an increase in public awareness about the need to commit more resources to aid students in their transitions from school to work, but most high school career counselors have responsibilities which preclude them from spending time on individual career counseling. This paper describes a project designed to determine if a piloted one-year career exploration class for high school seniors improved their career development compared to students who did not complete the class. The results demonstrated that the intervention significantly improved students' awareness and career exploration behaviors. After the intervention, 56% of the experimental group scored in the High Profile Type for both attitude and knowledge compared to 16% of the control and 22.7% of the national norm. The change between pre- and post-test career development knowledge scores was not significant and several factors are given for possible influences, including the fact that initial scores were already in the 49%, and the higher the benchmark, the more challenging it is to achieve improvement. The paper concludes that a year-long connection between students and teacher in a classroom environment may be an excellent way to stimulate career development. (Contains 14 tables and 29 references.) (JDM)

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UNIVERSITY OF LA VERNE

LA VERNE, CALIFORNIA

THE EFFECTS OF A TWO-SEMESTER CAREER EXPLORATION INTERVENTION CLASS ON THE CAREER DEVELOPMENT INVENTORY SCORES OF HIGH SCHOOL SENIORS

A Paper Prepared for the Graduate Seminar

in Partial Fulfillment of

the Requirements for the Degree

Master of Education

Mary C. O'Hara

August 2000

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SECTION I

THE PROBLEM

Introduction

Career intervention strategies for adolescents have traditionally been delivered through counselor-led small group meetings, individual counselor sessions, and various career guidance software and research books available at most high school career centers. However, most high school counselors carry a caseload of at least 200 students, and often many more. The pressing duties of discipline, academic counseling,

college planning and recommendations, and personal counseling often leave little time for career counseling. Although as Biehler & Snowman (1997) stated,

> The occupation we choose influences other aspects of our lives perhaps more than any other single factor. Our job determines how we will spend a sizable proportion of our time and how much money we earn; our income, in turn, affects where and how we live. Moreover, the last two factors determine, to a considerable extent, the people we interact with socially. All these elements together influence the reactions of others, and these reactions lead us to develop perceptions of ourselves. The choice of a career, therefore, may be the biggest commitment of a person's life. (p. 42)

often the student has very little guidance or help in making that decision.

The past decade has seen an increasing public awareness about the need to commit more educational resources to aid all students in their transitions from school to work. Evidences of the importance of this goal (cited in Isaacson & Brown, 1997) include the publication of the findings of the Secretary of the Department of Labor's Commission on Achieving Necessary Skills (SCANS) in 1991; the School-to-Work Opportunities Act of 1994; and the Goals 2000: Educate America Act, which became law in 1994 and was amended in 1996. The Goals 2000 Act (U. S. Department of Education, 1998) states that, "state and local systemic improvement strategies must provide all students with effective mechanisms and appropriate paths to the work force as well as to higher education" (Title III, Sec. 301 (9)).

Statement of the Problem

The National School-to-Work (STW) Learning and Information Center (2000) provides this answer to the question, "Why is it [School-to-Work] needed?"

> Many of America's young people leave school unequipped with skills they need to perform the jobs of a modern, competitive world economy. They often flounder in the labor market, wasting a decade or more in intermittent, low-paying jobs. Employers are having difficulty finding workers who are adequately prepared for today's more demanding jobs. Productivity lags and America's ability to compete in 21st century world markets is weakened. (p. 1)

Although there is consensus that educators must change their traditional methods if all America's children are to be well prepared for the high-paying, high-skilled jobs of the future, there is little agreement on exactly how this is to be achieved. There is even less research on this topic. The author believes that an intensive career exploration intervention that also teaches work place expectations delivered to high school students as a one-year course is an effective way to help young people be better prepared for the career challenges awaiting them.

Purpose of the Study

The author, a teacher at a suburban high school, piloted a one-year Career Exploration class for seniors in 1999-2000. Enough students were recruited for this elective class to fill one section which met four times a week (three 55-minute sessions and one 105-minute session) for the entire year. A quasi-experimental research study was designed and implemented to determine if and to what degree this career intervention improved the career development of these students compared to another group of students who were not in the class. If significant improvement resulted, further development of career exploration courses at the school could be justified.

Research Questions and Hypothesis

Students who experience the career intervention will show significant career development improvement compared to comparable students who do not participate in the experimental treatment. The study will also look at the correlation between career development changes and students' Grade Point Averages (GPAs). Any differences between sexes will also be analyzed and discussed.

Definitions of Terms

Career development

Career practitioners refer to the life-long process involving psychological, sociological, cultural, educational, economic, physical factors, and chance factors that interact to influence the career of the individual as career development.

Career intervention

A career intervention is a deliberate act aimed at enhancing some aspect of a person's career development including influencing the career decision making process and can include career guidance, career counseling, career information, career education, career development programs, and career coaching.

Nelson, Lott, and Glenn's discipline theory

This is a classroom discipline strategy that uses a regular class meeting and other techniques to help students develop important intrapersonal, interpersonal, strategic and judgmental skills. If teachers establish learning climates that foster responsibility, mutual respect, and cooperation, students learn the value of these work habits for themselves. Most work places require all employees to possess these skills

in order to be successful.

Senior Bridge

The career explorations class was called Senior Bridge and was scheduled immediately after the students' English class. The English teacher and the career exploration teacher integrated several projects and attempted to create a supportive and nurturing environment for all students. This two-class combination was called Senior Bridge. Five or six times throughout the year both teachers worked with the students during the same class period.

Scope of the Study

The experimental group consisted of 25 students who remained enrolled throughout the year and completed the pretest and posttest. The control group also consisted of 25 students who remained enrolled in the same class throughout the year and completed the pretest and posttest. Due to the reality of student choice in selecting which electives to take, it was not possible to have a true experimental random selection of subjects, and so any generalization of the study results to a larger population than the original group is not valid. The research study results may, nonetheless, be helpful in planning career interventions in secondary school settings.

SECTION II

REVIEW OF THE LITERATURE

Introduction

Published articles included in this review have been organized into four general topics dealing with career development in adolescents: the relationships of career maturity to other measures of personal development; case studies of career interventions; current status of research; and the use of the CDI as a measurement tool.

Literature Review

With only 21% of Americans graduating from a postsecondary college or university, more attention needs to be given to the needs of the remaining 79% throughout our educational system. By helping our young people understand and explore themselves and the world of work before they must make the transition from school to work, more will be satisfied with their adult lives (Blustein, Phillips, Jobin-Davis, Finkelberg, Roarke, 1997). Savickas agrees and offers four specific strategies to support the adolescent's often difficult change from dependent child to independent adult: orient the student to the tasks ahead; teach mastery of these tasks; coach the student about coping strategies; and provide role-rehearsal opportunities inside and outside of the classroom (Savickas,1999). School experiences appear to be the dominant factor which influences vocational interest (Vondracek & Skorikov, 1997), and yet "school and extracurricular activities do not provide students with relevant experience and feedback about their

potential for performing well in the world of work (p.10). This leads to frustration and floundering when naive expectations run headlong into demanding reality. Another study supports the necessity of possessing strong basic skills (in literacy, numeracy, employment skills, and good self-esteem) as a condition to avoid unemployment. (Bynner, 1997). Parents' active involvement in the school-based career counseling process is helpful to students according to a study by Amundson and Penner (cited in Young & Chen, 1999). A study about the effects of part-time work during high school on the subsequent success of cadets at military academy showed that cadets who had worked a few hours a week in high school (5 or less) fared better than those who had worked more hours and those who had not worked at all (Mael, Morath & McLellan, 1997). Hill and Rojewski (1999) found that lack of dependability caused at-risk youth to fail in school more than the lack of the other work ethic factors measured (interpersonal skills and initiative.) They recommend that the importance of dependability should be stressed throughout the curriculum. Special attention needs to be given to members of racial and ethnic minorities who tend to have lower career decision-making self-efficacy and trait anxiety compared to their White counterparts (Gloria & Hird, 1999). According to research published by Perrone, Perrone, Chan & Thomas (2000), working school counselors and career counseling theorists and consultants agreed that the three most important counselor competencies related to career counseling issues were to "listen to counselees' career concerns, help counselees develop a career plan, and refer students to community resources" (p. 8). Researchers Picklesimer, Hooper & Ginter (1998) recommend that counselors intervene with students who score low in life skills because they found "students planning to attend a 4-year college indicated they possess a higher life-skills level in relation to interpersonal communication/human relations skills than students planning on entering a technical or trade school" and "a greater skills level on physical fitness/health maintenance than students deciding on attending a 2-year college" (p. 5).

Research reports on career interventions do support the hypothesis that purposeful teaching and counseling can achieve positive effects on career maturity. Career Horizons was a one-week 6-hour a day intervention with middle school students who "demonstrated increases in career planning and exploration efficacy, educational and vocational development efficacy, number of careers they were considering, and congruence between interests and career choice" (O'Brien, Dukstein, Jackson, Tomlinson & Kamatuka,

1999, p.7). No changes were reported in levels of self-knowledge or understanding efficacy as measured by the Missouri Comprehensive Guidance Evaluation Survey: Grades 6-9. In another study, undeclared and undecided college students who participated in one of two treatments designed to increase career certainty showed substantial improvement as a result of either treatment. Jurgens (2000) states that, "It seems that interventions can be customized to fit the needs of an agency or organization and that even the most basic, cost-effective intervention may offer some relief to the undecided individual" (p.10). Betz and Voyten (1997) conducted research among college students that showed a strong positive correlation between both efficacy and career outcome expectations with career exploratory intentions. In other words, a positive attitude about one's future encourages one to be more involved in planning for that future.

Several articles reviewed discussed the current status of knowledge and theories regarding the school-to-career (or school-to-work) transition. Hansen (1999) points out that the School-to-Work (STW) Opportunities Act is legislated to sunset October 1, 2001, and too little attention is being given to integrating what is known about career counseling and career development into many of the current programs spending billions of dollars. Hansen states, "that STW is a modern trait and factor approach" (p. 1). A theory that is aligned to the realities of the 21st century workplace has yet to be developed. Swanson and Fouad (1999) recommend that person-environment fit theory should be employed in STW interventions, specifically in the following areas: exploration of self leading to self-knowledge; occupational knowledge; steps in decision-making; and opportunities to learn "on the job" in controlled, educational work environments. The results of these interventions need to be evaluated on an on-going basis. Krumboltz and Worthington (1999) offer the view that Krumboltz's learning theory of career counseling (cited on p. 1) is a better foundation upon which to base an intervention program than the human capital theory which they believe underlies the school-to-work movement. Sweetland (cited in Krumboltz & Worthington, 1999) states, "Human capital theory is based on two central premises: (a)workers with better educational backgrounds and training fare better in the labor market, and (b)nations with larger pools of human capital resources (i.e., workers qualified for jobs employers need to fill) will be more competitive in the global economy" (p.2). On the other hand, Krumboltz's learning theory calls for the following four needs to be the foundation for planning career interventions:

1. Young workers need to expand their capabilities and interests, rather than base decisions only on existing characteristics.
2. Students should prepare for changing work tasks, not assume that occupations will remain stable.
3. Students should be empowered to take action, not merely to decide on a future occupation.
4. Career counselors should play a major role in dealing with all career problems, not just occupational selection. (pp. 3, 4, 5 & 7)

Gati, Houminer & Fassa (1997) report on three studies that found that individuals who are faced with the complex and difficult decision on a career and who must compromise their ideal fantasy with the realistic options that are available to them believe that it's most difficult to compromise and reach a decision when the "compromise was framed in terms of alternatives, intermediate when compromise was framed in terms of aspect importance, and smallest when compromise was framed in terms of within-aspect preferences" (p. 3). More intervention research needs to be designed, implemented and published. Herr (1999), after a review of career development theories, comes to the conclusion that we lack theory to support needed career development among our young people. He states,

> Human resource development is a continuum of career development that (a) begins in the early lives of children in elementary schools and continues through the middle and secondary schools, (b) progresses into transition processes that, either seamlessly or jaggedly, connects [sic] schooling to employment, and (c) concludes with induction into and adjustment in the workplace. Thus, at a minimum, theories of career development are needed that focus on the schools, the process of transition from school to work, the period of induction into the workplace, and the interactions between these three components. Also necessary are theories of subpopulations, contexts, and interventions during each of the three components of the school to work transition. Do we have such needs for theory covered? Not really.

In a review of practice and research in career counseling and development for 1997, Swanson and Parcover (1998) conclude that "career counseling interventions, particularly their evaluation, received relatively little attention" (p22). In a subsequent review of practice and research in career counseling and development for 1998, Young and Chen (1999) concur, "Increased attention to qualitative-based assessment in career counseling would enhance the field" (p. 24).

A review of literature on the subject supported the choice of the Career Development Inventory (CDI) as the measurement tool for the research described in this paper. Savickas (1994) states, "the contribution that impressed me the most continues to be Super's work to linguistically explicate and operationally define career development, as epitomized in the Career Development Inventory" (p. 1).

Isaacson & Brown (1997) also consider Super to be one of the foremost contributors to the field of career development. Lewis, Savickas, and Jones used the CDI to predict success in medical school; Jackson and Healy used the CDI to determine that there was a significant effect for gender with women scoring higher than men on their knowledge of work and knowledge of decision making; and Ohler, Levinson, and Barker found no differences in CDI scores between college students diagnosed with learning disabilities and those who were not diagnosed with learning disabilities (all studies cited in Niles, 1997).

One article in particular was helpful in establishing a touchstone for the research described in this paper. Baker and Taylor (1998) analyzed the results of 30 career intervention research studies and determined that the average improvement in career development scores in the experimental groups (who received the career intervention) was an effect size of 0.39 or about four-tenths of a standard deviation.

Summary

Although career maturity is known to be a primary indicator of successful adaptation to adult roles, it appears that there is little research to support increasing the attention paid to better encouraging our young people to engage in the appropriate behaviors that will result in more successful transitions to adulthood, particularly in the case of the non-college graduate. Career maturity issues seem to be put in the laps of counselors instead of teachers and curriculum development specialists. Certainly there is an interest among professionals in the field of career development in encouraging research studies about the effects of career intervention among adolescents.

SECTION III

METHODOLOGY

Description of Research

The study assumed that an increase in the career maturity among high school students would be a desirable goal. The subject school was a West Coast, suburban, upper-middle-class, ethnically diverse high school with approximately 2200 students in grades 9-12, ranked in the ninth decile in the 1999 statewide Academic Performance Index. The school had been the recipient of a Goals 2000 grant from 1995-1999 which was used to fund school-to-career exploratory projects. One of the projects was a pilot class in Career Explorations. In the 1998-1999 school year, one section of an elective one-semester class open to all students was offered each semester. Informal student and teacher evaluations indicated that the older the student, the more benefit from the class he or she gained and that real change was only beginning to happen after one semester. Therefore, the 1999-2000 offering was a one-year class only open to seniors that was tied to the students' English class. It was named Senior Bridge, promoted on campus, included in the course catalog, and started the year with 28 enrollees.

The class used the discipline approach advocated by Nelson, Lott, & Glenn in *Positive Discipline*

in the Classroom (cited by Charles, 1999 on pp. 163-179). Each student took the following personal assessments, received the results, and then was involved in various lessons to understand the implications of the data: Myers-Briggs Personality Indicator- School Form (MBTI); the Differential Aptitude Test (DAT); Value Scale (VS); and the Strong Interest Inventory (Strong). For example, the students created charts comparing the estimated MBTI types of five characters from Chaucer's *Canterbury Tales*. A minimum of three in-depth research reports on careers the student expressed interest in exploring was required after the students were introduced to the major career research resources in the library and on the web. Videos and articles about the "new economy" and the changing world of work were studied and students compared the world of work as shown in *Beowulf* to the world of work of the 21st century, with particular emphasis on the differences and similarities between male and female roles, dangers to society, the role of the leader and the group, and the tools used. Major units studied throughout the year were problem-solving, teamwork, self-management, resume writing, interviewing, and conflict resolution. All students were required to arrange (with the help of the instructor, if necessary) a one-day job shadowing experience with someone who was employed in a career in which the student was seriously interested in pursuing. The initial contact letter, follow-up confirmation, behavior during the job shadow, and a subsequent thank-you letter paralleled the tasks involved in job hunting. Class-wide activities included filling out a prototype job application as an assignment, and then visiting a U.S. Census Data Processing Center and taking a data entry test, going through prospective employee orientation, and filling out an actual job application. Students could actually apply, or choose to use the experience as a role-playing exercise. (Five students were hired by the Census for part-time, short-term, well-paying jobs.) Students worked in teams on several "real life" projects that needed to be done. For example, they handled the recruitment for Senior Bridge for 2000-2001. The goal was to enroll 60 students and they enrolled 75. In 2000-2001 the students will have the goal to increase the advertising carried in the school's football program. A culminating activity was a parent night during which each student orally presented his or her understanding of self and a 10-year education and career plan to the entire gathered group.

The purpose of the research was to determine if these educational experiences significantly increased the career maturity of the participants compared to a control group.

Research Design

The closest that the researcher could come to a true experimental design was a quasi-experimental design which used a nonequivalent control group. Using symbols, the design looks like this:

O X O

O O

Selection of Subjects

The experimental group was self-selecting by means of enrolling in the class. The control group was a "regular" English class taught by the same teacher who taught the English class portion of Senior Bridge. In their English classes both groups received very similar instruction, read the same literature, and had the same homework and tests. The control group was not enrolled in the Career Explorations class, but the experimental group was enrolled. The initial number of experimental subjects was 28, but was reduced through attrition to 25 by the end of the year. The initial control group was 30, but only 25 successfully completed both the pretest and posttest.

Although the selection of students was not random, both groups did reflect the ethnicity of the school, which is 5% African American, 43% Asian, 9 % Filipino, 21% Hispanic or Latino, and 22% White. The experimental group was 16% African American, 44% Asian, 8% Filipino, 12% Hispanic or Latino, and 20% White. The control group was 4% African American, 52% Asian, 8% Filipino, 20% Hispanic or Latino, and 16% White.

Instrumentation

The test selected to measure the effect of the career intervention was the Career Development Inventory (CDI), a highly regarded norm-referenced test instrument. The test has two parts. Part I (Career Orientation) takes about 40 minutes and Part II (Knowledge of Preferred Occupations) takes about 25 minutes to complete. Part I includes Career Planning (CP) and Career Exploration (CE) which are also reported as a composite score Career Development - Attitudes (CDA). The CDA measures planfulness; awareness of and willingness to cope with the developmental tasks of exploration and establishment, and willingness to focus on these tasks as the need to recycle occurs at later life stages; and engagement, both affective and behavioral, in exploration, decision-making, planning, and the implementation of plans. Part

I also includes Decision-Making (DM) and World-of-Work Information (WW) which are reported as a composite score Career Development -Knowledge and Skills (CDK). The CDK measures acquisition of information about educational and occupational paths and the mores of the world of work and about the principles, processes, and content of career decision-making. Part II measures Knowledge of Preferred Occupation (PO) which is designed to assess familiarity with the type of work that students say interests them most. Students select one out of 20 broad occupational groups for the PO. The Career Orientation Score (COT) combines CP, CE, DM and WW, and as such is a composite measure of four important aspects of career maturity.

Standard scale scores, not raw scores, are used in the research analysis because the scales differ in types of items and in scoring procedures. The standard score used has a mean of 100 and standard deviation of 20. The PO results are analyzed separately because they are not included in the composite scores, and the composite scores have superior reliability. The reliability estimates (alpha coefficients) for the combined scales CDA, CDK, and COT, respectively, are .84, .86, and .85 for Grade 12 Totals; .84, .79, and .82 for Grade 12 Females; and .85, .88, and .87 for Grade 12 Males. The Standard Errors of Measurement for Grade 12 Totals are 8.1, 8.1 and 8.2, respectively. The Test-retest correlations are in the 70s and 80s for the three composite scores. Although the composite scales clearly have adequate reliability, the PO scores have median reliability estimates of .66 for Grade 12 Totals, .57 for Grade 12 Females, and .71 for Grade 12 Males. The Standard Error of Measurement for PO Grade 12 Totals is 11.8. The Test-retest correlation is less reliable also with a 62. Career-development characteristics are expected to be stable over several weeks or months; noticeable developmental changes occur only over periods of one or more years; high correlation would be expected between scores obtained on administrations separated by one to six months (Thompson, Lindeman, Super, Jordaan & Myers, 1984). The pretest-posttest interval for this research was nine months.

Data gathering

Both groups were given the CDI as a pretest to determine relative benchmark data during the first month of school (in September, 1999) on the same few days. The control group took the test in their English class and the experimental group took the test in their Careers class. Although it would have been

better to have both groups take the test in their English classes, it was not done because the experimental group was already "losing" some English instruction time due to special career development projects. During the same few days in June, both groups were given the posttest, again in their respective classes. Therefore, when comparing pretest or posttest scores between the experimental and control groups, there is one more variable to be considered. However, when comparing pretest to posttest scores for either the experimental or the control group, the same testing conditions existed for the pretest and the posttest.

Data analysis

Correlation analyses between Grade Point Averages (GPAs for all classes from Grade 9 through and including Grade 11) of the experimental and control groups and their respective CDA, CDK, COT, and PO scores were done using the Pearson product moment correlation coefficient (@RSQ in Lotus 1-2-3). All the measurements of central tendency were computed using the more conservative sample method to calculate standard deviation (or the n-1 method) which makes the standard deviation slightly larger than the n method to compensate for errors in the sample. A larger standard deviation is unbiased by sampling errors, and thus tends to be more accurate (@STDS in Lotus 1-2-3). Probability statistics were calculated using a two-tailed Student's t-test (@TTEST in Lotus 1-2-3). The probability level selected for judging the significance of statistical test differences was .05.

SECTION IV

DATA PRESENTATION AND ANALYSIS

Presentation of Data

There was virtually no correlation between either the experimental or the control group's GPAs compared to their respective pretest scores on the CDA and weak correlation compared to their pretest scores on the CDK. The mean of the control group's GPA was over one standard deviation higher than the experimental group's GPA mean at a $p<.001$. (See Table 1).

Table 1

The Correlation Between GPA and Scores on CDA and CDK for Test and Control Groups

Group	GPA Mean	GPA SD	ttest	9/99 CDA R2	9/99 CDK R2
Experimental	2.52	0.55	p<.001	0.02714	0.20161
Control	3.15	0.4		0.04365	0.31978

There was virtually no correlation between GPA and pretest/posttest differences. (See Table 2).

Table 2

The Correlation Between GPA and Pretest/Posttest Differences on CDI Scales

Group	COT R2	CDA R2	CDK R2	PO R2
Experimental	0.00028	0.0357	0.03181	0.04914
Control	0.03747	0.03178	0.0055	0.17857

The total mean scores for the experimental group increased significantly during the school year in the COT ($p<.02$) and the CDA ($p<.0006$), but the mean scores in the CDK and PO showed no significant growth. The CDA improvement was a full standard deviation. The total mean indexed to the equivalent national percentiles for the COT rose from the 40th percentile to the 70th percentile, for the CDA from the 41st percentile to the 73rd percentile, and remained constant at the 49th percentile and the 62nd percentile respectively for the CDK and the PO. Details regarding male and female differences can be seen on Tables 3, 4, 5, & 6.

Table 3

Pre- and Post-test COT Scores Compared to National Norm Percentiles
Experimental Group

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Group	Number	Mean	SD	p	Equiv.Nat'l Percentile
Females					
Pretest	7	97.6	13.7		23
				>.35	
Posttest	7	110.3	31.9		50
National Norms	540	110.2	19.3		42
Males					
Pretest	18	105.6	12.9		58
				<.02	
Posttest	18	118.9	19.1		78
National Norms	502	99.3	22		51
Total					
Pretest	25	103.4	13.3		40
				<.02	
Posttest	25	116.5	23		70
National Norms	1047	104.9	21.3		46

Table 4

Pre- and Post-test CDA Scores Compared to National Norm Percentiles
Experimental Group

Group	Number	Mean	SD	p	Equiv.Nat'l Percentile
Females					
Pretest	7	89.9	14.3		20
				<.05	
Posttest	7	117.1	26.1		71
National Norms	540	108.6	19.8		48
Males					
Pretest	18	104.1	13.8		46
				<.01	
Posttest	18	122.3	23.3		84
National Norms	502	104.9	20.6		56
Total					
Pretest	25	100.1.	15.1		41
				<.02	
Posttest	25	120.8	23.7		73
National Norms	1047	106.8	20.2		52

Table 5

Pre- and Post-test CDK Scores Compared to National Norm Percentiles
Experimental Group

Group	Number	Mean	SD	p	Equiv.Nat'l Percentile
Females					
Pretest	7	106.7	12.2		36
				>.58	
Posttest	7	100.7	25.4		30
National Norms	540	107.8	18.9		36
Males					
Pretest	18	105.9	13.1		63
				>.54	
Posttest	18	108.8	15.5		70
National Norms	502	94.6	22.5		49
Total					
Pretest	25	106.1	12.6		49
				>.9	
Posttest	25	106.5	18.6		49
National Norms	1047	101.4	21.7		43

Table 6

Pre- and Posttest PO Scores Compared to National Norm Percentiles
Experimental Group

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Group	Number	Mean	SD	p	Equiv.Nat'l Percentile
Females					
Pretest	7	101.7	12.1		43
				>.21	
Posttest	7	110.3	12.5		57
National Norms	540	102.4	20.2		43
Males					
Pretest	18	109.6	8.8		67
				>.77	
Posttest	18	110.1	12.5		67
National Norms	502	99.2	20.2		55
Total					
Pretest	25	107.4	10.2		62
				>.4	
Posttest	25	110.1	12.2		62
National Norms	1047	100.8	20.2		48

The control group experienced a significant decline in the total scores for the COT and the CDK ($p<.04$ and $p<.03$ respectively). The total scores for the CDA and PO showed no significant differences. The posttest COT means indexed to the national norms at the 40th percentile compared to the 52nd percentile in the pretest and the CDK was at the 31st percentile down from the 43rd. The CDA hovered in the 60th to 70th percentile range with no significant change and the PO stayed constant at the 48th percentile. Details can be found in Tables 7, 8, 9 & 10.

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Table 7

Pre- and Post-test COT Scores Compared to National Norm Percentiles
Control Group

Group	Number	Mean	SD	p	Equiv.Nat'l Percentile
Females					
Pretest	15	115	13.7		52
				>.1	
Posttest	15	102.9	20		29
National Norms	540	110.2	19.3		42
Males					
Pretest	10	106	16.4		58
				>.17	
Posttest	10	93.1	23.5		38
National Norms	502	99.3	22		51
Total					
Pretest	25	111.4	18.5		52
				<.04	
Posttest	25	99	21.5		40
National Norms	1047	104.9	21.3		46

Table 8

Pre- and Post-test CDA Scores Compared to National Norm Percentiles
Control Group

Group	Number	Mean	SD	p	Equiv.Nat'l Percentile
Females					
Pretest	15	117.4	14.3		71
				>.4	
Posttest	15	113.1	17.5		60
National Norms	540	108.6	19.8		48
Males					
Pretest	10	116.8	21.4		75
				>.31	
Posttest	10	107.5	19.1		56
National Norms	502	104.9	20.6		56
Total					
Pretest	25	117.2	17.7		73
				>.2	
Posttest	25	110.9	18		62
National Norms	1047	106.8	20.2		52

Table 9

Pre- and Post-test CDK Scores Compared to National Norm Percentiles
Control Group

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Group	Number	Mean	SD	p	Equiv.Nat'l Percentile
Females					
Pretest	15	107.6	12.2		36
				>.09	
Posttest	15	92.9	21		20
National Norms	540	107.8	18.9		36
Males					
Pretest	10	94	16.5		49
				>.23	
Posttest	10	83.2	22.6		39
National Norms	502	94.6	22.5		49
Total					
Pretest	25	102.2	19		43
				<.03	
Posttest	25	89	21.7		31
National Norms	1047	101.4	21.7		43

Table 10

Pre- and Post-test PO Scores Compared to National Norm Percentiles
Control Group

Group	Number*	Mean	SD	p	Equiv.Nat'l Percentile
Females					73
Pretest	7	114.4	14		
				>.1	43
Posttest	7	100.6	18.1		43
National Norms	540	102.4	20.2		
Males					
Pretest	8	100.5	19.1		55
				>.4	
Posttest	8	107.3	9.44		67
National Norms	502	99.2	20.2		55
Total					
Pretest	15	107	18.6		62
				>.6	
Posttest	15	104.1	14		48
National Norms	1047	100.8	20.2		48

*Total numbers are lower than for other tests because of incomplete Part II sections of several subjects' tests (the PO scale). Caution is advised when comparing these numbers.

Table 11 compares the variance in pretest/posttest scores between the experimental and the control group. The experimental group clearly improved significantly in their career attitudes (CDA) compared to the control group, which in turn caused the Senior Bridge students' overall mean composite score to also show

significant improvement compared to the group who did not receive any career intervention. Although the Career Knowledge improvement did not quite make it to the desired level of probability ($p<.05$), there was a strong enough *t*test result ($p<.055$) to believe that the CDK differences should also be given serious consideration regarding their statistical probability. No significant differences were seen in the relative variance of the PO scores between the two groups.

Table 11

Summary of Total Improvement (-Decline) in CDI Scores During Term of Career Intervention (9/99 to 6/00) as Measured by Pretest and Posttest

		COT	CDA	CDK	PO
TEST (N)25	**MEAN**	13.12	20.76	0.12	2.76
	S.D.	19.76	20.35	17.79	14.48
CONTROL (N)25	**MEAN**	-12.44	-6.28	-10.4	-2.93
	S.D.	18.62	18.84	19.95	21.96
TTEST		p<.00005	p<.00002	p<.055	p>.3

A *t*test was run to compare the female, male and total mean scores of the pre-test and the students GPAs to determine which differences between the experimental and test groups were significant. The results on Table 12 indicate that the statistically significant differences among those items were female COT scores; GAP scores of female, male and total; CDA scores for females and total; and CDK male scores. All other differences were statistically insignificant.

Table 12

The Probability Factors for the Pretest Differences Between the Means of the Experimental Group and the Control Group

	COT	GPA	CDA	CDK	PO
FEMALE	p<.05	p<.01	p<.001	p>.05	p>.05
MALE	p>.05	p<.05	p>.05	p<.05	p>.05
TOTAL	p>.05	p<.00005	p<.001	p>.05	p>.05

All twenty-five of the experimental group filled in their Occupational Group Preference (OGP) in

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both the pretest and the posttest CDI Form. Fourteen students, or 56%, changed their OGP from the pretest to the posttest. Only sixteen of the control group filled in the OGP on both tests; and 11 of those, or 68.8%, changed their OGP from the pretest to the posttest.

Thompson, Lindeman, Super, Jordaan & Myers (1984, Vol. II., p.33) analyzed the total CDI norming group according to the percentages within grade who ranked high, medium or low in the CDA and CDK. The percentages of the experimental and control groups who ranked high, medium and low are compared to the norms for Grade 12 in Tables 13 and 14. The relative strengths of the experimental group's scores are clearly apparent.

Table 13

Percentage of 12 Grade CDA-CDK Profile Types for Experimental, National Norms and Control Groups at Conclusion of Career Intervention (June, 2000)

Profile Type CDA-CDK	Experimental Percentages	National Norm Percentages	Control Percentages
H-H	56	22.7	16
H-M	16	13.1	8
H-L	8	11.2	28
M-H	4	11.6	8
M-M	0	8.3	4
M-L	8	12	16
L-H	0	6.2	0
L-M	0	4.7	8
L-L	8	10	12
TOTAL PERCENTAGE	100	99.9	100
TOTAL NUMBER	25	1043	25

Table 14

Percentages of Profile Types Categorized by High Attitude, High Knowledge, Low Attitude & Low Knowledge for Pre- and Posttest Experimental and Control Groups Compared to 12th Grade National Norms

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Profile Category	% Pretest Experimental	% Pretest Control	% National Norm	% Posttest Experimental	% Posttest Control
High Attitude H-H, H-M, H-L	36	68	47	80	52
High Knowledge H-H, M-H, L-H	36	40	40.5	60	24
Low Attitude L-H, L-M, L-L	24	12	21	8	20
Low Knowledge H-L, M-L, L-L	12	28	33.3	24	56

Analysis of Results

The need to provide students and parents with elective class choices necessitated a nonequivalent control group design for this research. Although the control group's overall GPA was considerably higher than the experimental group, this was probably not a factor in the different pretest results because there was no significant correlation between GPA and test results. The experimental group had fewer females (28%) than the control group had (60%). The only significant differences between the CDI scores of two groups were because the experimental female CDA (Attitudinal) mean score (89.9, S. D. 14.3) was significantly lower than the control female CDA mean score (117.4, S. D. 14.3) and the experimental male CDK (Knowledge) mean score (105.9, S. D. 13.1) was significantly higher than the control male CDK mean score (94, S. D. 16.5). The Part I composite score (COT) for the total experimental group was at the 40th national percentile while the COT for the total control group was at the 52nd national percentile compared to the national norm for Grade 12 at the 46th percentile. Both groups began the year with reasonably average scores.

In analyzing the relative change in CDI scores for both groups from pre-intervention in September, 1999, to post-intervention in June, 2000, a surprising trend surfaced in the control group. Scores declined. The researcher expected scores to improve for the experimental group and for the scores to remain constant or perhaps improve slightly for the control group. A significant increase in the experimental COT scores from a total mean of 103.4 (S. D. 13.3) to 116.5 (S. D. 23) $p<.02$ was accompanied by a significant decrease in the control COT scores from a total mean of 111.4 (S. D. 18.5) to 99 (S. D. 21.5) $p<.04$. The experimental group outpaced the control group in Attitude and Knowledge with significant comparative improvement in CDA scores (up 20.76 points compared to loss of 6.28 points) and

lesser, but still noticeable, change in CDK scores (up 0.12 points compared to loss of 10.4 points). There was no significant difference between the pre-test and post-test PO scores for either group.

In the experimental group, the Attitudinal (CDA) female mean was a whole standard deviation lower than the male mean in the pre-test, but only one-fifth of a standard deviation lower in the post-test. Both groups improved significantly and the females were able to almost catch up with their male peers. Neither sex showed significant change in either the Knowledge (CDK) mean or the Knowledge of Preferred Occupation (PO) mean between the pre-test and the post-test.

In the control group, the CDA female mean was close to the male mean in both the pre- and post-test. Neither sex showed significant change from the pre-test to the post-test. The CDK female mean was about two-thirds of a standard deviation higher than the male in the pretest and about one-half of a standard deviation higher in the posttest. Although neither the male nor the female scores showed significant change on the CDK from the pre-test to the post-test, when combined the total scores did show a significant decline.

Summary

The research indicated that students who experienced the career intervention called Senior Bridge showed significant career development improvement compared to comparable students who did not participate in the experimental treatment, particularly in the Attitudinal measures on the CDI. However, their Knowledge of Preferred Occupation (PO) scores did not improve. The results of both groups showed very little correlation with their GPAs on any of the CDI scales. The relative performance of males compared to females was inconsistent.

SECTION V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The present time demands fundamental change in the way humans interact with work. Adaptability has always been the key to survival, but with the ever-accelerating pace of change today, young people must be introduced to the mores of work in the 21st century and taught the critical knowledge and attitudes to use in charting their careers through an unpredictable future. The educational establishment is engaged in the struggle to change itself to better prepare young people for the world that awaits them; however, there is much confusion and disagreement about the best way to do this.

Research on career interventions and their effects on improving career maturity is, therefore, of interest. Unfortunately, there is very little research available. What little research there is, however, does seem to indicate that young people who possess good basic skills and a high level of career maturity are more likely to successfully join the employed mainstream than those people who lack these skills. Therefore, programs that increase career development are desirable. The Career Development Inventory is a valuable tool in measuring progress along the continuum of career development.

Senior Bridge did succeed in improving attitudinal measures about career planning and exploration, but was not as successful in changing knowledge of the world of work or decision-making cognitive measures.

Conclusions

A one-year career intervention fashioned as a class allowed daily contact between the teacher and students and significantly improved students' awareness, concern, and career exploration behaviors. To a lesser degree, the class also improved the students' knowledge of the world of work and decision-making skills. Knowledge of the preferred occupation did not have any significant change. Students who leave high school with high scores on both attitudinal and knowledge (CDA and CDK) not only say they are ready to plan their careers, but they have some valid knowledge about careers and the world of work. After the intervention, 56 percent of the experimental group scored in the High Profile Type for both, compared to 16 percent of the control and 22.7 percent of the national norm. Senior Bridge was effective in increasing the experimental students' career development. Using Baker and Taylor's (1998) benchmark of about four-tenths of a standard deviation as the average improvement in career development scores in experimental groups , the six-tenths of a standard deviation improvement in overall COT scores was above average.

Implications and Inferences

The experimental group began the intervention with national percentile scores of about 40 percentile compared to the national norm of 46. Even though the high school population is upper-middle-class, the students in Senior Bridge were below average for the school in GPA. Their counselors encouraged more than one student to enroll because the counselors believed the students were unmotivated

and did not have clear career goals. The relatively low CDA mean score (100.1, S. D. 15.1), compared to the control group (117.2, S. D. 17.7) and the national norm (106.5, S. D. 21.7), implies that the students in the test group had not engaged in career planning and exploration behaviors very much at the beginning of the class. The posttest CDA mean of 120.6 was accompanied by a S. D. of 23.7. Those students who participated fully in the course did a great deal of career planning and exploration and the increase is a logical consequence of that activity. The standard deviation grew among the class, however, as some students lagged behind their peers.

The change between pre- and post-test CDK scores was not significant. Several factors may have influenced the lack of improvement. Firstly, the initial scores were already in the 49th percentile, and the higher the benchmark, the more challenging to achieve improvement. Secondly, the lessons on decision-making and the world of work, which were part of the curriculum, may have been ineffective. Thirdly, the lower GPA of the experimental group may exist because the group has less interest, motivation and skills in acquiring knowledge regardless of the subject matter. Fourthly, perhaps work-based knowledge is more easily learned through experience in the workplace, rather than in the classroom.

Neither the experimental nor the control group showed any significant differences in the Knowledge of Preferred Occupation (PO) Scores. This is not surprising based on the extremely high number of students who changed their Preferred Occupation selection from the pre-test to the post-test (56% of the experimental and 68.8% of the control). Adolescence is a time of exploration, and perhaps it is a healthy sign that both groups are exploring different occupations and may only learn enough about one occupation to eliminate it from consideration before moving on to explore a new area. Conversely, the high level of changes could be a sign of aimlessness and confusion. The PO is also the least reliable of the CDI Scales. The PO mean was also already significantly higher than national norms for both groups (the posttest mean for the experimental group and the pre-test mean for the control group were both in the 62nd percentile.)

The declines of the control group were puzzling. The drop in CDK scores was significant ($p < .03$) and caused the COT loss to be statistically significant too. ($p < .04$). The CDA and PO showed no statistical difference. Perhaps the Knowledge loss happened because of the higher percentage of Preferred

Occupational Group changes. It's also possible that the control group was under the spell of "senioritis" and did not give their best effort when taking the test because it did not seem to have anything to do with their English class, but the experimental class saw the reason for analyzing their career development and tried their best. Another possibility is that the members of the control class realized that important career decisions were coming closer day by day and they had not really prepared to make them yet; perhaps that realization colored their responses and reduced their scores.

Another very interesting issue came to light in Tables 13 and 14. The ideal student profile is high CDA scores accompanied by equally high CDK scores. This identifies a person who is well-prepared to engage in the next developmentally appropriate stage of career development. More than half of the students in the experimental group were ranked this way in the post-test compared to roughly one in five nationally and one in six in the control group. One in four control students assessed their own career attitudes and exploration activities as high, but ranked low in knowledge, a profile that indicates an unrealistic evaluation of one's career development. The experimental group had a closer alignment between attitude and knowledge in the pre-test and the post-test than did the control group. Because the experimental group chose to participate in the class, they may have started with a more realistic mindset than the control group. Both the control and the experimental group had average percentages of high knowledge profiles, but the control group had almost double the percentage of high attitude profiles than the experimental.

Recommendations

The one-year Senior Bridge concept is one that deserves further implementation, testing, and research. It increased CDI scores compared to the control group and compared to national norms. Anecdotal feedback from students and parents also supports its continued existence. A year-long connection between students and teacher in a classroom environment that uses problem-based learning may be an excellent way to stimulate career development. Although students who engage in a rigorous college preparatory course of study do develop a strong work ethic and good problem-solving skills, many students who just "get by" doing as little as possible do not. They will be better able to succeed in adult life the sooner a "reality check" like Senior Bridge occurs.

Research that explores what happens over time to students who do not receive career intervention compared to students who do is necessary in order to justify spending public funds to offer career courses. If interventions such as Senior Bridge do increase a person's productivity and contentment with work as an adult, then attention needs to be given to developing and testing interventions and their timing and frequency in a young person's life to determine the best method.

It is possible for teachers and administrators to offer student-centered career development programs that help individual students fully develop their special gifts and interests that, at the same time, help keep America's workforce competitive in the global marketplace.

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